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What Makes a Good Project? A Proposed Assessment of Students, Teachers, and Observers.

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What Makes a Good Project? A Proposed Assessment of Students, Teachers, and Observers

by

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Dedication

I dedicate this report to my beautiful and supportive partner Kelly, without whom I would never have discovered the deliciously mad and wonderful world of teaching.

Abstract

What Makes a Good Project? A Proposed Assessment of Students, Teachers, and Observers

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Much research has been conducted about project-based instruction (PBI) instantiation under a variety of conditions, yet there is a lack of literature that details the successes and challenges accrued by students, teachers, and outside observers during actual PBI implementation. In order to determine the conditions necessary to realize a successful project, I have developed a method (modified from Petrosino's PBI research with preservice teachers [19]) to investigate the PBI affinity and knowledge level of participants. Students, teachers, and observers will complete a survey and rate a specific project experience from their past using a PBI literature-based project rubric; the rubric analyses will be

compared to their survey responses as a further assessment of their philosophical support and comprehension of PBI. Furthermore, I have created three protocols to interview a random subset of participants from each frame of reference. I will then compare the responses of each group to responses from PBI researchers with expertise in the history and practice of PBI, illuminating precisely where PBI theorists and practitioners diverge. This data will allow us to analyze ways in which the interacting beliefs and actions of these three groups complicate the practical implementation of PBI. By identifying where PBI implementations struggle, we can suggest and construct successful scaffolds for students, teachers, and classroom observers.

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BACKGROUND AND LITERATURE REVIEW

A Brief History of PBI

From the beginning of the previous century, educational theorists have hypothesized that students best learn new information presented within a real-world context. Dewey began the call for inquiry-based learning in the first third of the 21st century. He worked for years to popularize the idea that meaningful learning is situated in experiences and interactions, but implementation of his ideas was limited [8, 9].

In the 1930s, a group of thirty schools banded together in a progressive teaching attempt known as the Eight-Year Study. Yet the teachers were overworked and quickly overwhelmed by the innumerable and myriad challenges they faced – including opposition from parents and the state – and the study was never repeated [29].

In the 1970s and 1980s, project-based learning came back in vogue at the post-secondary level as an innovative and successful methodology for teaching medical students. In 1980, Barrows' influential paper defined problem-based learning as that which "results from the process of working toward the understanding or resolution of a problem" [1]. (At this point in time, the distinction between project-based and problem-based learning was not made.) Eleven years later, in 1991, Blumenfeld's work began to delineate the conditions necessary for meaningful learning to occur in a project-based environment.

Specifically, he and his group focused on the need for authentic, complex, collaborative projects that successfully increase student motivation and cognitive focus [4].

By late 1990s, PBI and similar socio-constructivist learning frameworks were well established as *the* up-and-coming educational trend in the United States. These types of frameworks combine the fundamentals of inquiry learning with Vygotskian social learning theory [28, 29]. Barron, et al. published a seminal study in 1998, proposing four key principles that distinguish problem- and project-based learning (PBL) from other constructivist learning frameworks. These four elements are: a driving question that supports student learning and reflection, scaffolding that reflects both student and teacher needs, ongoing formative assessment, and meticulous process scaffolding to transition students into active learners [3]. In the years to follow, multiple researchers came out with variations on these four key elements.

KEY PBI CHARACTERISTICS

In the present day, this type of social constructivism has come to be encapsulated within a myriad of titles, including (but not limited to): project-based instruction, problem-based learning, discovery learning, inquiry learning, case-based learning, and performance-based science. As noted, PBI is one such instructional framework. Researchers have discovered that successful PBI units possess certain essential attributes. It is these key elements that differentiate PBI from other, similar-sounding instructional frameworks. For the purposes of this paper, PBI will be identified by the presence and sophistication of six key tenets, described in detail below. Although each of these characteristics has been discussed in the literature in the past, here I hope to unpack important aspects of each tenet by representing this knowledge in a rubric form. I created my literature-based rubric to focus on the following six tenets of project-based instruction:

1) **A driving question:**

According to the literature, an authentic and meaningful driving question is essential to effective project-based instruction. All PBI-focused articles include a discussion of driving questions. Although choosing a good driving question appears to be one of the simplest parts of project design, driving question construction is deceptively complicated. A driving question must be sufficiently complex to drive weeks of rigorous yet engaging study, but it must also be carefully designed to cover essential content concepts. Barron (1998), Thomas (2000), Petrosino (1998, 2004, 2010), Prince (2006), Massa (2008), and a multitude of other researchers and authors all agree that an accessible and meaningful driving question is essential for PBI success [3-5, 7-9, 11, 15-21, 23, 27]. It is the characteristics of said driving question that remains under debate. Some researchers focus on the need for strong content focus and depth, while others believe that a project needs a strong school-community bond before all other considerations. Bouillion and Gomez studied the Chicago River Project, where they make use of what they describe as a ‘bridging scaffold’, something that connects new, more academic knowledge to a known, social experience. Their bridging scaffold is a type of PBI they call ‘mutual-benefit partnerships’ or MBPs. The primary difference between MBPs and other types of PBI is the emphasis on student products being legitimately used within the community and by the adult partnerships formed throughout the project [5]. Regardless of focus, all successful PBI enactments documented in the literature are motivated by a strong driving question.

2) **A culminating learner product:**

In something known as project-based instruction, a culminating learner product is implied by the name alone. However, there is disagreement as to what form or function the ending product of a project should serve. Performance-based PBI (pPBI) is common in engineering and the physical sciences: learners work together to design a physical object to meet pre-specified standards within a given set of limitations. A common struggle in pPBI is helping students connect the experience of building their product with the deeper ideas and methods of the studied discipline – a physical product alone does not demonstrate meaningful student understanding [25]. Other PBI instantiations do not require a tangible product. Linn (2003) describes their Web-based Inquiry Science Environment (WISE) curriculum projects, which are one-week mini-projects that scaffold student learning of a particular science concept. These short projects are designed for student pairs, and each unit includes scaffolding devices and formative assessments embedded into the curriculum, but learners do not construct a tangible artifact as they complete each project [14]. Regardless of format, successful PBI implementation requires a carefully designed learner product that addresses the original driving question [2, 7, 11, 12, 15, 18, 19, 23, 27].

3) **Academic rigor with a constructivist bent:**

Project-based instruction is the synthesis of educational research and discoveries from across the past century. The model of education first known as ‘project-based learning’ was found in post-secondary education, primarily medical schools [27]. The learning model was inductive: students were expected to co-construct meaning from the specifics of the project, problem, or case study presented [23]. Currently, most PBI found in the literature includes constructive inquiry opportunities that are relevant to the driving question and product: indeed, inductive learning is often a hallmark of the PBI process [3, 7-9, 11, 14, 15, 18, 19-23, 25, 27]. Projects are often expected to be fairly lengthy to be successful: usually greater than two weeks, but oftentimes projects can take months or even last the length of an entire course [3, 5, 7, 9, 11, 15, 17, 18, 21, 25]. Case studies of successful PBI teachers often note a classroom focus on authentic or student-collected data: Petrosino’s 2004 case study of an experienced and highly successful PBI teacher describes how the students work to collect and analyze data for researchers at a near-by university, increasing student motivation and buy-in [20]. The Chicago River Project (2001) experiences success through use of a bridging scaffold to connect students and their work to the community directly outside their doors [5]. These projects are authentic, open-ended, and often ill-defined: by more closely approximating the complexity and ambiguousness of life outside the classroom, learners engage with new material at higher cognitive levels. For meaningful understanding, students need to be carefully scaffolded to develop and expand their metacognitive skills to successfully complete the project [2, 7, 15, 17, 18, 19, 20, 25-27].

4) **Scaffolding:**

Three types of scaffolding are essential to successful PBI implementation. These three types are: academic, metacognitive, and social. Academic scaffolding, as described here, refers to the scaffolding that is most commonly found in traditional classrooms: structures and activities that aid student understanding of content knowledge and skills. In 2004, Reiser presented a nuanced discussion of scaffolding tools, and he characterized them according to their learning support purpose. He believes that all software-based scaffolding mechanisms can be categorized as having one of two possible functions: structuring the learning task, or problematizing the learning task [24]. Most academic scaffolding serves to structure and guide learner knowledge acquisition, rather than problematize the learning process.

Metacognitive scaffolding helps the learner acquire understanding about how they think, and encourages reflective practices that help students transition into self-directed learners. Many PBI researchers and practitioners advocate strongly for careful metacognitive scaffolding throughout project implementation. In 2000, Kuhn documented success when both metatask (Why should I do this next step to get to my goal?) and metastrategic (why is this strategy better than the others?) scaffolding was incorporated into a middle school project. He argues against project naysayers who claim that projects do not produce sufficient student learning to justify the large amount of classroom time they consume: “In short, students come to understand that they are able to acquire knowledge they desire, in virtually any content domain, in ways that they can initiate, manage, and execute on their own, and that such knowledge is empowering” [p. 496, 13]. But these kind of long-term gains are only possible when students are carefully scaffolded toward success [13].

Metacognitive scaffolding can be considered either structuring or problematizing depending on its purpose within the project. The WISE project designers included metacognitive scaffolding within their easily adaptable mini-projects to structure student reflection – pop-up windows appear during the course of the project to encourage students to take notes and make hypotheses. The program then prompts students to revisit their notes and predictions later within the project [14]. WISE projects are designed to structure student reflection and thereby increase understanding and retention. In their 2006 article “Jumping the PBL Implementation Hurdle,” Etmer and Simons note that both teachers and students can be distracted from central content principles towards less important aspects of product design, and so metacognitive scaffolding is particularly vital to keep learners focused on important content goals [10].

Metacognitive scaffolding can also problematize student efforts, prompting students to deepen their thinking and confront submerged preconceptions about the content. For instance, Sadler's work in 2000 with middle school design projects includes a surprising metacognitive scaffold: presenting the students with simple directions to build a first, fairly bad version of the product – an initial prototype. Although this method helps structure initial design attempts, it also problematizes student work by eliminating fruitless design attempts and guiding them toward meaningful variable manipulation and analysis [25]. The highest goal of PBI is reshaping passive, disengaged students into active, self-motivated, and self-guided learners, an aspiration that can be realized only with intelligent and judicious metacognitive scaffolding for PBI students.

Social scaffolding is the final (and most neglected) type of scaffolding needed for a successful PBI classroom. In a way, this lack is surprising: foundational PBI literature almost uniformly classifies the collaborative nature of PBI as one if its central tenets. For instance, Blumenfeld (1991), Barron (1998), Crawford (2000), Thomas (2000), Linn (2003), Petrosino (2004), Prince (2006), and Savery (2006) all agree that the successful completion of a PBI project should require student interaction with their peers [3, 4, 7, 14, 20, 23, 26, 27]. Yet in a literature review of PBI scaffolding, we find many instances of student and teacher scaffolds. (For example: Barron (1998), Kuhn (2000), Sadler (2000), Bouillion (2001), Linn (2004) and Kanter (2010) to name just a few [3, 5, 11, 13, 25]) but rarely is there a discussion of how to scaffold students to be able to effectively function, academically and socially, within a collaborative group of their peers.

In 2003, Barron and his team performed a detailed quantitative and qualitative analysis of 7th grade students working in groups of three to solve a cognitively complex math task. They attempted to identify which group characteristics led to positive learning outcomes for the individual team members. Their results debunk some of the classic explanations for why certain groups succeed where others fail. Barron demonstrated that student teams with high math-aptitude individuals are no more likely to be successful than other teams; unsuccessful groups are just as talkative and produce just as many correct answers as the successful groups. Instead, the results suggest that the difference occurs in how the student groups respond to new ideas from team members – the successful groups are much more likely to engage with all new ideas, both good and bad [2]. But although this data is highly relevant to successful project implementation, no scaffolds or suggestions were made to assist teachers in adapting the results of this research to their own classroom. The non-intuitive nature of Barron's results suggest that social scaffolding will be a complex and challenging task for teachers and curriculum designers working to support student success.

5) **Collaboration and community opportunities:**

Social constructivism fuels the collaborative focus of most PBI – according to Vygotsky, social interaction is the critical framework through which knowledge construction and understanding occurs [28]. A project, at its best, is meant to connect students and their community, imbuing students with a sense of ownership and empowerment. However, the multiple PBI instantiations found in literature demonstrate very different ideas of what collaboration and community mean within a PBI environment. Some PBI instantiations, such as the Chicago River Project outlined by Bouillion, strong local connections and relevance to the neighborhood where the students live is considered essential to meaningful student learning [5]. Other PBI educators (often in the sciences) feel that student connection to a global network of collaborating professionals is the best practice. The two experienced, successful PBI science teachers studied by Crawford (2000) and Petrosino (2004) focused on building authentic connections to a larger scientific community rather than a local or regional community [7, 20].

Still other PBI projects have been designed to connect to students as members of their school community: Kanter's 2010 research describes the creation and enactment of a carefully constructed PBI unit called 'I, Bio'. The creators of this unit included teachers, professors, and curriculum design specialists, and the article details the careful, difficult design work they preformed to ensure students would connect body systems and energy flow to the energy transfers occurring in themselves and the people and campus surrounding them [11]. In the context of diverse projects and classrooms, literature interpretations of what exactly community connections look like differ, but each new connection to the outside world offers students another authentic opportunity for meaningful learning. But even though the details are distinct, the basic call for greater student-community connections is continuous across PBI literature.

6) **Assessment practices:**

Although some PBI theorists do not consider assessment a critical project design component, a small but vocal group makes a strong claim for frequent, formative assessments. Specifically, Barron (1998); Markum's 2003 project-based learning guide (and the sixty-two high schools in the New Tech Network, who use the PBL version outlined in Markum's book); Petrosino (2004); and Sadler (2000) all express decisive support for assessments that are frequently given, carefully planned to test the knowledge and skills required to address the driving question, and rapidly graded and returned [3, 15, 18, 20, 25]. For example, in Sadler's work with middle school design projects, he advocates testing product designs against nature: "Applying the wrong ideas in a design does not just result in lower grade; it means that a device will work less well than employing more applicable ideas – you cannot just talk your way around it" [p.303, 25]. Assessments must be meaningful and formative yet central to the project itself.

Although there are six specific key tenets identified here, each one shares two essential instructional goals: creating and sustaining student-centered, authentic instruction. It is the presence and complexity of these six PBI aspects that interact to realize a successful project: a complex, authentic driving question; a learner product directly connected to the driving question; rigorous academic content taught using constructivist instructional theories; detailed academic, social, and metacognitive scaffolding over the course of the project; the opportunity for student connections both to peers and to the larger, outside community; and frequent, formative assessments. Together, these distinguishing attributes allow the identification and assessment of project-based instruction.

PBI Implementation Challenges

Just as the essential elements needed for successful PBI have been extensively defined throughout the literature, the difficulties of actually implementing PBI effectively are equally well established. Authentically enacting PBI – in the classroom or as an entire campus – is a long-term process that requires high-level scaffolding for teachers, students, outside observers. Barron cites three monumental and simultaneous changes – to curriculum, instruction, and assessment – that are necessary for a successful transition to a PBI environment. The difficulties inherent to making these changes arise again and again in PBI research: indeed, Barron's work includes a teacher scaffold to help surmount some of the challenges faced when designing project-based curricula [3]. It is at the instructional level that PBI implementation difficulties are first experienced, and it is therefore these teaching challenges that have been most studied. In particular, much research has been done to study the individual experiences of teachers and students over the course of one carefully crafted PBI unit.

Teachers are the first, foundational level of PBI implementation, and it is therefore their implementation challenges that have the greatest urgency to be addressed. Windschitl's 2002 paper describes a framework to analyze the range and variety of challenges facing a teacher new to constructivism. This framework consists of four central dilemmas that novice teachers face: conceptual, pedagogical, cultural, and political [29].

As learners themselves, teachers suffer from preconceptions about the theoretical ideals of PBI that limit their ability to apply them in their classrooms. Although most teachers grasp the basics of project-based instruction after limited training, they struggle to understand the underlying educational philosophies motivating PBI classroom practices without a greater depth and breadth of PBI education [6]. For example, the experienced teacher from Petrosino's 2004 case study admitted that he still struggles with the assessment part of project design – he inadvertently reverted toward traditional assessment methods despite an otherwise innovative curriculum [20]. Teachers new to projects therefore struggle to move beyond a simple, shallow enactment of projects: they require scaffolding and support to achieve success.

Etmer and Simons' identified three pedagogical challenges teachers face when enacting problem-based learning for the first time. Although their work specifically applies to PBL rather than PBI, their definition of project-based *learning* applies equally to my definition of project-based *instruction* as used in this paper. They label PBL as such: “students’ work is organized around solving a complex, ill-structured problem that encompasses authentic, discipline-based content” [p. 41, 10]. The three challenges cited are: establishing and monitoring successful student collaboration, adapting to new roles and responsibilities, and detailed, project-specific scaffolding of student learning. A teacher needs “to balance the unique needs of individual learners, teaching colleagues, and administrators” [p. 42, 10]. The variety and diversity of teacher demands adds to the challenge of attempting to juggle them all simultaneously.

Unfortunately, establishing and monitoring successful student collaboration is the first of the three pedagogical teacher barriers to successful project implementation identified by Etmer and Simons [10]. As discussed above, peer collaboration is essential to successful PBI, but scaffolding successful cooperative learning environments is a difficult process with a steep learning curve. As noted above, if teachers are to succeed in a PBI classroom, they must be able to assume new and challenging roles. In a science-focused case study, Crawford carefully observed a single, successful PBI teacher and attempted to quantify the elements of this teacher’s success. She identified a total of ten new roles that a PBI teacher needs to assume: motivator, diagnostician, guide, innovator, experimenter, researcher, modeler, mentor, collaborator, and learner. [7].

In Savery's 2006 overview of project-based learning, he describes the need for PBI teachers to act as both facilitators and instruction sources, often about information not found in traditional textbooks [26]. Teachers new to project-based instruction are asked to step far beyond traditional instructional practices into a hazy, uncertain, and open-ended new world of teaching, where they must adapt fluidly to fill new, dynamic roles. One of the challenging roles that new PBI teachers assume is that of project designer. Kanter's 2010 article delineated the challenges faced by a high-powered, interdisciplinary team of curriculum designers, educational researchers, and classroom teachers who came together to construct one long-term human systems project. Despite the strength of their team, they struggled throughout the creation process. Kanter describes some of the scaffolding methods they used to work through these project creation difficulties, but he calls for more scaffolds to support the burden of project design for PBI teachers [11].

The final PBI pedagogical difficulty identified by Simon and Etmer is the creation of detailed scaffolding for student learning. In a project-based classroom, the roles of teacher and student are inherently intertwined. As teachers struggle to adjust to new ways of teaching and learning, they must simultaneously help their students struggle absorb and implement new practices and technologies. During Crawford's work with an experienced project-based science teacher, she observed that the students assumed many new roles: active collaborator, leader, apprentice, teacher, and planner. The teacher utilized careful scaffolding – self-designed through years of trial and error – to build student ownership over the course of a long-term project [7].

Even the structure of language itself needs to change within a PBI classroom. Polman discusses the need to reform the traditional teacher-student ‘initiation-reply-evaluation’ dialogue into a dialogic activity structure suitable for a small-group PBL environment. Successful dialogic structures will increase student metacognitive scaffolding and expand dialogue to include written, illustrated, and oral communication [22]. Teachers will need support to apply these novel scaffolding devices in a PBI classroom.

In her case study of a successful PBI science teacher, Kuhn’s 2000 article describes the meticulous cognitive skills required for student success in a PBI environment. Students need teacher guidance to expand the technological, social, and cognitive abilities needed within project-based learning (PBL) [13]. Petrosino presented a 2004 case study of a highly experienced and lauded teacher throughout one project within the Hands on Universe PBI curriculum, who cites scaffolding as essential to successful project implementation [20].

Windshitl in 2002 identifies social and cultural gaps between school content and the surrounding community, which can problematize PBI implementation. Learners in ever more global classrooms have varying frames of reference, methods of thinking, and discourse patterns that complicate project-based instruction [29]. Disconnect between curricula and students’ home culture undermines the effectiveness of PBI. For project-based instruction to succeed, learners need to meaningfully connect to the projects in which they engage. Bouillion and Gomez describe this issue in depth during a case study of the 5th grade students and teachers who create and engage in a long-term, student-driven project known as the Chicago River Project. The authors summarize the problem succinctly: “Schools are in communities but often not of communities”. The Chicago River Project succeeded through what they call a ‘bridging scaffold’, something that connects new, more academic knowledge to a known, social experience. However, this success comes at an educational cost: the students and teachers invested a significant amount of time outside of class during this project, which can be difficult to justify during this age of testing and teacher accountability [5].

Sadler’s work on scaffolding engineering competitions with at-risk middle school students addresses the need to support female students in performance-based projects. Female learners (and other at-risk students) often come with less experience and knowledge of science – a cultural learning gap. He describes a new scaffolding method to ease into design projects: present students with simple directions to build a first, fairly bad version of the product – an initial prototype. Even this simple scaffolding step provides an easy entry point into a design project. But without any introductory scaffolding, many students struggle, become frustrated, and disengage with design-based projects [26].

The last of the central challenges facing PBI teachers, identified by Windschitl in his 2002 article, is political: “political dilemmas are associated with resistance from various stakeholders in school communities when institutional norms are questioned and routines of privilege and authority are disturbed" [p. 132, 29]. He notes that constructivist education is:

> situated in the ambiguities, tensions, and compromises that arise among stakeholders in the educational enterprise… The most profound challenges for teachers … [include] dealing with the pervasive educational conservatism that works against efforts to teach for understanding [p. 131, 29].

In Prince and Felder's 2006 comparison of inductive teaching methods, administrative support was shown to be crucial in teachers' willingness and ability to successfully transition to PBI [23].

PBI research clearly reveals the difficulty of individual project implementation at four levels: conceptual, pedagogical, cultural, and political. However, less attention has been dedicated to viewing PBI through a wider, multi-project lens. By studying PBI implementation without the constraints of a specific project, we may be able to identify implementation struggles that cross disciplines or grade levels, patterns that would not be detectable with a very small data set. A few meta-analyses of PBI research exist from over the last two decades, but often their focus remains on comparing PBI examples, defining the term itself, and analyzing outcomes to determine PBI efficacy when compared to traditional education [23, 26, 27]. Even less research exists to study student perspectives of project success – Crawford's 2000 case study and Petrosino's 2004 case study both include student feedback, useful date which helped the researchers identify project strengths and weaknesses [7, 20]. However, we need a much greater range of data if we wish to draw wider conclusions.

RESEARCH PROPOSAL

Little research exists in the literature that studies the perceptions and conceptions of observers who visit PBI classrooms. This is an important gap to fill – the novel techniques being applied in a PBI classroom could look like disorder, especially when being implemented for the first few times. Many observers come into classrooms, with many different levels of pedagogical knowledge: parents, other teachers, school administrators, instructional coaches, curriculum designers, district surveyors, and so on. Imagine that one of these outside observers entered the classroom of a novice PBI teacher, but without a clear understand of PBI or the steep student/ teacher learning curve. Instead of seeing students challenged to work together in a new and demanding learning style, they might see frustrated and disorderly students. Rather than seeing a developing teacher stretching their teaching methods and capabilities in extraordinary new ways, that observer might instead see an unsuccessful or untrained teacher. As a result, rather than providing that struggling teacher with PBI-specific guidance and support, observers might act to limit or derail PBI altogether.

The particular difficulty embodied here is that teachers implement PBI, but they are not involved in deciding PBI's level of success. Windshitl notes that constructivist education is “situated in the ambiguities, tensions, and compromises that arise among stakeholders in the educational enterprise” [p. 131, 29]. It is the school that judges teacher efficacy, the school district that determines school achievement, and so on: ever upward the train of accountability goes. It is essential for outside observers to understand PBI at a fundamental level in order to accurately critique PBI classrooms from a constructivist perspective. Unless we gather and analyze information about what observers see and how they process it, we will be unable to determine how much observer attitudes and perceptions influence the success of PBI implementation. Without the full support of their school and district, few teachers will be able to successfully transition into a learner-driven PBI classroom. But with a wider lens in which to view and support PBI implementation – at the classroom, school, and district level – project-based instruction can successfully realize the dream of increased student success across the globe.

Here I present a proposal for a research study to assess theoretical PBI understanding and PBI affinity of teachers, students, and outside observers. I would like to determine how consistently each group understands the theoretical underpinnings of PBI, and if there is a relationship between their understanding of PBI and their PBI affinity. I will ask each group about specific enactments of PBI in which they have taught or engaged, and I will compare this information to their measured PBI affinity. This data will allow us to analyze ways in which beliefs and actions of these three groups complicate the practical implementation of PBI. Their beliefs about PBI success will be compared to the perspective of PBI researchers with expertise in the history and educational frameworks that guide and support PBI – said experts will compare the student products and lesson artifacts to determine a theoretical view on the project's success. Comparison and analysis of 'theoretical' PBI success to 'participant-experienced' PBI success should highlight some of the challenges experienced during PBI implementation.

To adequately address the query posed above, I framed our driving question as such: in a PBI classroom, what conditions are necessary to realize a successful project? Using PBI-focused literature as my guide, I created a project rubric that summarized project suggestions and recommendations from a range of successful project descriptions (Appendix A). This literature-based project rubric will be used to test alignment between the beliefs of PBI practitioners and researchers. PBI researchers and theorists will analyze the student products and lesson artifacts to evaluate the projects learners and teachers have identified as successful. Comparing the researchers' interpretations to the results of the student, teacher, and observer surveys and follow-up interviews will provide a rich new source of data about effectively implementing PBI.

This survey (Appendix B) has been crafted to determine teachers' general PBI affinity as well as their thoughts about one project from the past year they found successful. For the third analysis level, individual teachers would be invited to individual interviews (see Appendix E for the interview protocol). The PBI affinity survey as well as the structure and format of the focus group interview questions are modified from Petrosino's work with preservice teachers [19]. Surveys and interview protocols have also been created for the two other frames of reference: that of a student and that of an outside observer (Appendices C, D, F, and G).

In total, this research will be submitted as a research proposal for approval prior to the collection of data to both the Austin Independent School District (AISD) Office of External Research and the University of Texas at Austin's Institutional Review Board (IRB), with the goal of completing the study during the 2010 – 2011 academic year.

WHO WILL BE THE SUBJECTS OF THIS RESEARCH?

To locate a suitably large number of PBI-familiar teachers, students, and outside observers for this study, I will be asking for volunteers from all three New Technology Network campuses that are found in AISD: Eastside Memorial Global Tech (EMGT) and Eastside Memorial Green Tech (EMGrT) high schools, as well as Akins New Technology High School (ANTHS). This will ensure that participating teachers will include both teachers entirely new to PBI as well as those who have one or more years of PBI teaching experience. We will use this same methodology when seeking student participants.

It will also be necessary to identify outside observers to participate in this research. Because the Eastside Memorial New Tech schools are both new and novel, they have many outside observers who come into the school: parents, Asia Society observers, New Tech observers, administrators, and district personnel. These circumstances create a unique opportunity, allowing us to capture a rich sample of observers new to PBI and others with a greater depth of PBI experience. ANTHS has been a PBI-based school for two more years than the Eastside schools, and so they should also have a wide number of observers, including administrators, with greater PBI experience and expertise.

As a control group, I will ask for student, teacher, and observer participants from two non-project-based schools within AISD, Lyndon B. Johnson (LBJ) high school and (non-New Technology) Akins High School. Both Akins and LBJ are large, traditional high schools with a very similar student population to Eastside Memorial and ANTHS: high-need, at-risk students. Responses from the three participant groups at Akins and LBJ will be compared to the responses from participants at the three, small PBI campuses.

WHAT QUESTIONS WILL BE ADDRESSED IN THIS RESEARCH?

There are multiple questions that we wish to address through the proposed research. First and foremost: how does each of the three groups define a 'successful project' within the context of a PBI classroom? We would like to identify what conditions teachers and students feel are necessary to teach and engage in a successful project. For outside observers, what criteria do they use to identify successful PBI classrooms? We can then compare these beliefs to literature specifications for successful PBI projects.

A specific focus of interest is the differences between the literature ideals of PBI and actual PBI implementation in real-life. We hope to begin to discover how closely actual classroom practice mirrors theoretical suggestions. Our analysis will hopefully suggest further action and research to encourage successful projects within PBI classrooms, by students, teachers, and observers.

EDUCATIONAL IMPLICATIONS

The results of this research could have wide-reaching implications for teachers, researchers, and administrations that work within a PBI framework. By identifying the conditions necessary to realize a successful project, as well as the difficulties experienced by PBI participants at multiple frames of reference, illuminating precisely where PBI theorists and practitioners diverge.

IMPLICATIONS WITHIN THE CLASSROOM

PBI is complex and requires many changes for the classroom teacher, many of which should happen simultaneously for optimum effect [1-8, 1—13, 18]. A checklist of what a successful project needs could make implementation less frustrating and more successful on the part of the teacher. It would also keep all stakeholders normalized with regards to what PBI looks like and requires. The rubric is the initial version of this checklist. (Appendix A). It can scaffold project design, and also iterations of project revisions by providing suggestions for improvements. It is also possible that simply by reading through the checklist and using it to analyze a project will emphasize the key components they need to experience PBI success.

IMPLICATIONS OUTSIDE OF THE CLASSROOM

Similarly, the rubric could be provided to classroom observers as a tool to evaluate PBI in action. Careful and judicious use would be necessary, as would investigation into what can and cannot be observed during a limited classroom observation. People considering PBI for future use in their schools and districts can use the collected data to identify potential PBI implementation difficulties, and therefore how and where to best support new PB I teachers and campuses. Furthermore, educational researchers who evaluate PBI's effectiveness will have a clarified frame of reference in which to identify successful project implementation.

PRELIMINARY RESULTS

As a trial run, three teachers agreed to take the Teacher PBI Survey, and then use the PBI rubric to assess the same project that they discussed on their survey.

TEACHER A

The first teacher to try both the survey and the rubric was my co-teacher last year at EMGT. We taught a completely interdisciplinary English/science class known as Chemlish: technically, I was the chemistry teacher and she the English teacher. In the day-to-day workings of the classroom, however, our teaching roles were far more blended; we both became English and science teachers. Therefore, as an initial test of the rubric's strength, both she and I independently evaluated the same project: an evolution and ecology-themed project based on the movie *Avatar*. I compared my rubric analysis of the project with that of my co-teacher to evaluate the rubric's objectivity.

TEACHER B

The second participating teacher was a math teacher last year at EMGT. She chose to evaluate a pre-TAKS project where the students created games to review different concepts they had learned throughout the year, and where she was pleased with the high level of student engagement and completion. The teacher was happy to note that the rubric confirmed her opinion of the product's success.

TEACHER C

The third teacher to try both the survey and the rubric was also a math teacher last year at EMGT. She liked that the rubric pointed out areas of weakness she already intended to improve when she uses the project again.

NEXT STEPS

The first step to be completed before any research may be conducted is an application to both the IRB and AISD for permission to conduct this research during the 2010-2011 school year. After receiving permission from these bodies, it will be possible to contact the principal of each campus and establish a whole-faculty opportunity to present this research proposal to the teaching and administrative staff, seeking teacher and observer volunteers. Staff from each individual campus will be approached to enlist advice in indentifying student volunteers. Because all of the PBI-based high schools that will be studied are part of the New Technology Network, representatives of this organization will be approached to determine willingness to participate in the proposed research as outside observers.

Once participants have been identified and the initial survey and rubric data collected, a random subset from each group will be asked to participate in individual interviews. The qualitative data from these interviews should be a useful contrast to the qualitative and quantitative data that will be available from the survey and rubric results. In combination, an analysis of this data will clarify how the interacting beliefs and actions of students, teachers, and observers complicate the practical implementation of PBI. The results will reveal the level of correlation between the three groups and experts in PBI comprehension and affinity, information that will suggest further directions for PBI research and curriculum design.

Appendix A: Project Rubric

Kristina Lestik

PROJECT RUBRIC

UTeach Summer 2010

criteria	Developing	Proficient	Advanced
Driving Question	• The driving question is not based on content standards. • The driving question has little or no connection to the outside community. • The driving question is not meaningful or accessible to students. • The driving question has only one correct solution, and can be solved in a limited number of ways.	• The driving question is based on content standards. [7,9,11,12,15,18, 27] • The answer or product derived from the driving question is relevant to audiences outside the classroom. [4,5,7-9,11,15,16,18-21,23,27] • The driving question is accessible and meaningful to students. [5,7,9,11,15,17-20,23,25] • The driving question has multiple correct answers or solutions. [7,16,18-21,25,26] • The driving question creates a sense of urgency, a "need to know'. [3,4,7,18,20,23,27]	In addition to "Proficient" attributes: • The driving question is open-ended, with no specific correct answer. [7,11,19,25] • The driving question can be solved using multiple methods. [7,11,18-20,25]
Learner Product	• The project is not based on content standards. • The product is only vaguely related to the driving question. • The product is not tangible.	• The product is based on content standards. [7,9,11,12,15,17,18,27] • The product is directly related to the driving question. [2,7,11,12,15,18,19, 23,27] • The product is tangible. [9,11,16,19,20,23,25,26] • The product requires students to apply new knowledge and skills. [7,11,12,15-18,21,23,26,27] • The product includes a written or oral presentation. [7,18,23]	In addition to "Proficient" attributes: • The product is used or evaluated by audiences outside the classroom. [5,7,9,11,15,18,27] • The product includes multiple representations of knowledge. [2,7,15,19, 23,25] • The product requires students to integrate new knowledge and skills with their existing skill set. [7,11,15,18,19,25,27]
Academic Rigor	• The knowledge and skills being learned are not based on content standards. • The project takes one week or less to complete. • The project is primarily teacher-driven or directed. • The majority of information is conveyed to students through direct teach methods.	• The knowledge and skills learned are based on content standards. [7,9,11,12,15,18,20,27] • The project is student-centered. [5,7,8,9,11,15,16,18,19,20,21,23,25,27] • The project includes constructive inquiry opportunities that are relevant to the driving question and product. [3,7-9,11,14,15,18,19-23,25,27] • Students must apply the intended knowledge to successfully complete the project (and not merely rely on what they already know). [7,11,15,17,18,20,21,23-27] • The project takes place over an extended period of time. [3,5,7,9,11,15,17,18,21,25]	In addition to "Proficient" attributes: • Most or all of data used is authentic or student-collected data. [5,7,18,19,20,21,25,27] • Students are investigating authentic questions that have uncertain or unknown solutions. [3,5,7,11,19-21,27] • Students interact with persons outside the classroom to gain knowledge or skills that are relevant to the driving question and product. [5,7,15,18,20] • Students often use primary sources to collect information. [7,14,15,18,20,25] • Students develop and expand metacognitive skills to successfully complete the project. [2,7,15,17,18,19,20,25-27]
Scaffolding	• Scaffolding is inconsistent or rarely used. • Students are allowed little choice, or only choices that are relatively unimportant to the project.	• Knowledge and skills are heavily scaffolded in the beginning of the project, but these scaffolds are removed over time. [3,7,9,14,15,17,23] • The project requires students to use technology to address the driving question OR to create the final product. [2,7,9,12,14,15,17,18,20,24,25,27] • Students are allowed choice in one or more meaningful areas of the project. [5,7,9,15,18-21,23,26,27] • Scaffolding is academic and social OR academic and metacognitive. [2-4,7-12,15-22,24-27,29]	In addition to "Proficient" attributes: • Scaffolding is academic, social, AND metacognitive. [2,4,9,15,18,19,24]
Collaboration/ Community	• Students work primarily by themselves. Collaborative work is often not related to the driving question or learner product. • Students interact only with teachers who are involved in the project. • Students do not feel a connection to the project or the driving question, and have difficulty relating to it.	• Successful completion of the project requires student interaction with peers. [2-4,9,12,14-19,22-25,27,29] • Students interact meaningfully at least once with adults from outside the classroom. [5,7,11,15,18,20,21] • Students are investigating a problem that relates to themselves, their community, OR the world. [2,5,7-9,11,12,15-20,23,25,27,29]	In addition to "Proficient" attributes: • Successful completion of the product requires interaction with persons outside the classroom. [5,7,11,18-21] • Students interact with multiple knowledgeable adults in the outside community. [5,7,15,18,20,21] • Students are able to see knowledgeable adults interact in their place of employment. [7,15,18] • Students are investigating a problem that relates to themselves, their community, AND the world. [7,11,15,17,18,19,27]

Assessment	• Assessments are primarily summative. • Assessments are not related to the driving question or the product.	• Assessments are primarily formative. [3,15,18-21,25] • Assessments are related to the intended knowledge and skills students need to obtain to successfully complete project. [3, 11,12,15,16,18-21,25,27] • Students are given rapid feedback on most/ all assessments. [3,15,18,25]	In addition to "Proficient" attributes: • Assessments are frequent (approximately one or more assessments per three hours of class time). [3,15,18,20,25] • Students are assessed on non-academic skills: collaboration, work ethic, etc. [2,15,18]

Appendix B: Teacher PBI Survey

Project-Based Instruction (PBI)/ Project-Based Learning (PBL) Survey *for Teachers*

Name:___________________________ School:____________________ Date:_______

Sex: F M

Grade(s) taught (in PBI environment):

Subject(s) taught (in PBI environment):

Years of experience teaching in a PBI environment:

Part I: PBI Affinity Survey

1. What would you consider to be the key elements of Project-Based Instruction? In other words, how would you recognize PBI in a secondary school classroom?

2. Rank how much you agree with each of the following statements.

    a. *In theory*, PBI represents best practices in secondary instruction; all instruction should be done in this format.

    Strongly agree   Agree   Disagree   Strongly disagree

    b. *In practice*, PBI represents best practices in secondary instruction; all instruction should be done in this format.

    Strongly agree   Agree   Disagree   Strongly disagree

    c. PBI represents one of a spectrum of valuable approaches to instruction. Good secondary instruction should include both project-based and non-project-based instruction.

    Strongly agree   Agree   Disagree   Strongly disagree

    d. PBI should serve as an overlay to traditional instruction, providing a connecting framework. It enhances traditional instruction but is not critical in secondary classrooms.

    Strongly agree   Agree   Disagree   Strongly disagree

    e. PBI is useful as a motivator to help students learn material. PBI should serve as a reward in secondary classrooms but is not a way to convey content to students.

    Strongly agree   Agree   Disagree   Strongly disagree

f. PBI is a distraction in secondary classrooms. This format of instruction does not contribute to learning.

   Strongly agree Agree Disagree Strongly disagree

3. Briefly describe how you implemented PBI during the past school year (if at all). Please include the source for any curriculum materials you used (i.e. New Tech, Asia Society).

Part II: PBI Rubric and Project Survey

1. Think back to a project that you successfully taught in a PBI format. Briefly describe this project and how you knew it was successful.

2. Thinking about the project you described above, rank how much you agree with each of the following statements.

   a. My project had a clear driving question that was accessible to students.

      Strongly agree Agree Disagree Strongly disagree

   b. My project had a clear driving question that was meaningful to students.

      Strongly agree Agree Disagree Strongly disagree

   c. Students created a tangible product that was directly related to the driving question.

      Strongly agree Agree Disagree Strongly disagree

   d. During the project, my students learned new knowledge and skills that they needed to create a final product.

      Strongly agree Agree Disagree Strongly disagree

   e. Students were allowed choice in one or more meaningful areas of the project.

      Strongly agree Agree Disagree Strongly disagree

   f. The project required students to use technology to address the driving question or to create the final product.

      Strongly agree Agree Disagree Strongly disagree

   g. Successful completion of the project required student collaboration with peers.

      Strongly agree Agree Disagree Strongly disagree

h. Students investigated a problem that relates to themselves, their family, or their community.

Strongly agree   Agree   Disagree   Strongly disagree

i. Students were given frequent, formative assessments throughout the course of the project.

Strongly agree   Agree   Disagree   Strongly disagree

j. Successful completion of the project required student collaboration with adults outside of the classroom.

Strongly agree   Agree   Disagree   Strongly disagree

3. What were some barriers or difficulties to implementing PBI that you encountered during your project?

4. In an ideal world, what changes would you make to improve your project?

5. Do you think you will utilize this project again in the future? If so, how will you modify it (if at all)? If not, why?

Appendix C: Student PBI Survey

Project-Based Instruction (PBI)/ Project-Based Learning (PBL) Survey ***for Students***

Name:___________________________ School:____________________ Date:_______

Sex: F M Grade: 9 10 11 12

Years of high school with project-based instruction (like Global and Green Tech): _____

Years of high school at a traditional school: ______

Part I: PBI Affinity Survey

1. What does a project-based (PBI) classroom look like?

2. What are some differences between a project-based classroom and a traditional classroom?

3. In what ways does PBI help you learn (as compared to a traditional class)?

4. In what ways does PBI limit (hurt) your learning (as compared to a traditional class)?

5. What does a successful student look like in a project-based classroom? Is it any different than in a traditional classroom?

6. Rank how much you agree with each of the following statements.
   a. PBI is the best way to learn in high school - all classes should be project-based.

      Strongly agree Agree Disagree Strongly disagree

   b. Good high school classes should have both project-based and non-project-based instruction.

      Strongly agree Agree Disagree Strongly disagree

   c. Projects enhance traditional instruction (make it better), but they are not necessary in high school classrooms.

      Strongly agree Agree Disagree Strongly disagree

d. PBI is useful to motivate and engage students. PBI should serve as a reward when student do well, but it is not a good way to teach information to students.

   Strongly agree   Agree   Disagree   Strongly disagree

e. PBI is a distraction in secondary classrooms. This format of instruction does not help student learning.

   Strongly agree   Agree   Disagree   Strongly disagree

7. Briefly describe your experience with PBI in the past. How many of your classes were mostly project-based? Did you find that doing projects helped you learn?

Part II: Project Survey

1. Think back to a project last year in which you were **successful**. Briefly describe this project and how you were successful.

2. Thinking about the <u>same project</u>, answer the following questions.
   a. In what class was this project taught? (English, Biology, Art, Newspaper, etc)

   b. What time of year was it when you did this project? (Fall, spring, November, Easter, beginning of school, etc)

   c. What did you make for the end of the project – that is, what was your final product? (A brochure, an essay, a presentation, an object, etc)

3. Again, thinking back to the <u>same project</u>, rank how much you agree with these statements.
   a. This project started with a clear question that needed to be answered.

Strongly agree   Agree   Disagree   Strongly disagree   I don't remember

   b. This project started with a question that was meaningful to my family, my community, or me.

Strongly agree   Agree   Disagree   Strongly disagree   I don't remember

   c. This project started with a question that was important to the world.

Strongly agree   Agree   Disagree   Strongly disagree   I don't remember

d. For this project, I created a tangible product (something that you can touch and feel, such as an object or a drawing).

Strongly agree Agree Disagree Strongly disagree I don't remember

e. The project that I made was connected to the starting question.

Strongly agree Agree Disagree Strongly disagree I don't remember

f. I learned new things during the project, and I needed to know these things to make my final product.

Strongly agree Agree Disagree Strongly disagree I don't remember

g. I was given at least some choice about how to make my product.

Strongly agree Agree Disagree Strongly disagree I don't remember

h. I needed to use technology to answer the initial question or to create the final product.

Strongly agree Agree Disagree Strongly disagree I don't remember

i. To successfully complete the project, I was required to collaborate with other classmates.

Strongly agree Agree Disagree Strongly disagree I don't remember

j. To successfully complete the project, I was required to interact with adults outside of the classroom.

Strongly agree Agree Disagree Strongly disagree I don't remember

k. During the project, I had many opportunities to see if I was doing well (quizzes, tests, practice work, teacher check-ins, etc).

Strongly agree Agree Disagree Strongly disagree I don't remember

Appendix D: Observer PBI Survey

Project-Based Instruction (PBI)/ Project-Based Learning (PBL) Survey *for Observers*

Name:__________________________________ Date:_____________________

Job Title:______________________________ Organization:_________________

Sex: F M

Year(s) in current position:

Year(s) of teaching experience (if any):

Part I: PBI Affinity Survey

1. What would you consider to be the key elements of Project-Based Instruction? In other words, how would you recognize PBI in a secondary school classroom?

2. Rank how much you agree with each of the following statements.

    a. *In theory*, PBI represents best practices in secondary instruction; all instruction should be done in this format.

    Strongly agree Agree Disagree Strongly disagree

    b. *In practice*, PBI represents best practices in secondary instruction; all instruction should be done in this format.

    Strongly agree Agree Disagree Strongly disagree

    c. I feel confident that I can differentiate between a well-run PBI classroom and a poorly run PBI classroom.

    Strongly agree Agree Disagree Strongly disagree

    d. I feel comfortable identifying key elements of PBI (as opposed to problem-based instruction, inquiry learning, engineering design projects, etc) when I see them used in the classroom.

    Strongly agree Agree Disagree Strongly disagree

    e. PBI represents one of a spectrum of valuable approaches to instruction. Good secondary instruction should include both project-based and non-project-based instruction.

    Strongly agree Agree Disagree Strongly disagree

f. PBI should serve as an overlay to traditional instruction, providing a connecting framework. It enhances traditional instruction but is not critical in secondary classrooms.

   Strongly agree Agree Disagree Strongly disagree

g. PBI is useful as a motivator to help students learn material. PBI should serve as a reward in secondary classrooms but is not a way to convey content to students.

   Strongly agree Agree Disagree Strongly disagree

h. PBI is a distraction in secondary classrooms. This format of instruction does not contribute to learning.

   Strongly agree Agree Disagree Strongly disagree

i. I am unlikely to accurately separate key elements of project-based instruction from other constructivist learning methods such as problem-based instruction and inquiry learning.

   Strongly agree Agree Disagree Strongly disagree

j. I do not feel comfortable distinguishing between successful and unsuccessful implementations of PBI.

   Strongly agree Agree Disagree Strongly disagree

3. Briefly describe any prior experience with a PBI environment. Have you ever taught in a PBI classroom?

Part II: PBI Rubric and Project Survey

1. Think back to a specific classroom where you observed a successful PBI lesson (or series of lessons). Briefly describe what you saw, the type of project going on (if you know), and how you knew it was a successful example of PBI.

2. Now think about successful PBI classrooms that you have observed. Thinking about these examples as a whole, rank how much you agree with each of the following statements.

In a successful PBI classroom:

a. Students worked in groups.

Strongly agree Agree Disagree Strongly disagree

b. Students utilized technology on a frequent basis.

Strongly agree Agree Disagree Strongly disagree

c. Students were motivated and on-task.

Strongly agree Agree Disagree Strongly disagree

d. Students were given choices.

Strongly agree Agree Disagree Strongly disagree

e. What students were working on always related back to the driving question.

Strongly agree Agree Disagree Strongly disagree

f. Students were investigating a problem that relates to themselves, their family, or their community.

Strongly agree Agree Disagree Strongly disagree

g. Successful completion of the project required student collaboration with adults outside of the classroom.

Strongly agree Agree Disagree Strongly disagree

3. What are some barriers or difficulties to implementing PBI that you have seen in your observations?

Appendix E: Teacher Interview Protocol

I would like to ask you to briefly describe a project-based unit or a project-based instruction that you taught during the 2009-2010 school year.

↓

How was your PBI unit designed? Did you create the unit yourself, adapt it from other curriculum, or borrow it mostly intact?

↓

What was the driving question of your PBI unit?

↓

What deep principles were you trying to cover?

↓

How did your PBI unit work in terms of:

- Classroom management?
- Student learning in your content area?
- Student motivation or engagement?

↓

Would you consider this project a success?

If **YES**

In what terms was this unit successful?

↓

Do you think you will utilize this project again in the future? If so, how will you modify it (if at all)?

↓

What are some barriers or difficulties you encountered while implementing this unit?

↓

In what way do you consider this to be an authentic implementation of project-based instruction?

↓

What do you consider to be the ideal environment for PBI implementation?

If **No**

What outcome led you to determine lack of success?

↓

Do you think you will utilize this project again in the future? If so, how will you modify it to increase student learning?

↓

What are some barriers or difficulties you encountered while implementing this unit?

↓

Are there any ways in which you consider this to be an authentic implementation of project-based instruction?

↓

What do you consider to be the ideal environment for PBI implementation?

Appendix F: Student Interview Protocol

I would like to ask you to briefly describe a project that you completed during the 2009-2010 school year.

↓

What was the driving question of your project? (That is, what is the starting question that you were trying to answer?)

↓

What new knowledge or skills did you learn in this project?

↓

What did you make for your end product? (That is, what did you have to turn in at the end?)

↓

In what class was this project taught?

↓

Was the project you describe for a required class or was it for an elective (choice) class?

If **required Class**

Do you think you learned more or less from this project than you might have learned from ‘normal’ work? Why?

↓

In what ways were you successful in this project?

↓

What was difficult for you during this project?

↓

What did you find most interesting or useful about the project, and why?

↓

How could this project be changed to help you learn more?

If **Elective class project**

Did you choose to take this class, do you need it for graduation, or were you put in this class without choice?

↓

In what ways were you successful in this project?

↓

What was difficult for you during this project?

↓

What did you find most interesting or useful about the project, and why?

↓

How could this project be changed to help you learn more?

Appendix G: Observer Interview Protocol

I would like to ask you to briefly describe any prior experience you have had with PBI. Have you ever taught in a PBI classroom? How long have you observed project-based instruction?

↓

How important is PBI at the secondary level – should classes be primarily project-based, an approximately even mixture of project - and non-project-based, or primarily non-project-based for optimal student learning.

↓

Does PBI increase student learning in the short term? (less than one year)? In the long term? (greater than one year)

↓

Do you feel comfortable identifying a PBI classroom and assessing the quality of PBI implementation? Why or why not?

↓

What would you look for to identify a well-run PBI classroom in terms of:

- Classroom management?
- Student learning in the content area?
- Student motivation or engagement?

↓

What outcome would lead you to determine that a particular project is unsuccessful?

↓

What do you consider to be the ideal environment for PBI implementation?

↓

What are some of the most common *teacher* struggles that you have witnessed in PBI classrooms?

↓

What are some of the most common *student* struggles that you have witnessed in PBI classrooms?

↓

What are some of the greatest barriers that *you* have faced as an observer in PBI classrooms?

↓

If you were to teach a high school class during the following school year, would you teach in a project-based instruction framework? Why or why not?

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Vita

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